



Application No.: 09/633,155
Filed: August 4, 2000
Group Art Unit: 2756

In the Drawings

Please amend Figures 9, 16c, 17, 18, 19, 20, 23, 26, 35, and 55 as shown in red in the attached drawings.

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REMARKS

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Applicant respectfully requests that the Examiner enter the amendments set forth above prior to examining the above-referenced application.

Applicant amends the specification and Figures 9, 16c, 17, 18, 19, 20, 23, 26, 35, and 55 to correct typographical errors. Specifically, reference numeral 32 is a duplicate. Therefore applicant replaces reference numeral 32 with reference numeral 41 in both the specification and Figures 9, 16c, 17, 18, 19, 20, 23, and 26. Applicant adds reference numeral 41 to the connection between NMS 60 and the network device 540 in Figure 35. Reference numeral 838 is added to the input marked "Alt. Input from other EX CTS" in Figure 55. Both reference numeral 41 and reference numeral 838 are referred to in the specification and used in other figures to designate the same part of the invention. No new matter is added by these amendments.

In addition, Applicant amends Figure 55 to remove an extraneous line section to indicate the correct connection of the *output* 770 to the Alt. *output* to other EX CTS. Support for this amendment can be found throughout the specification, for example, on page 129, lines 15-17. In particular, the specification at page 129 recites that "the output 770 (marked "Alt. Output to other EX CTS") of timing module 76 may be provided to the other EX CTS and received as input 838 (marked "Alt. Input from other EX CTS"). Thus, no new matter is added by this amendment.

For the Examiner's convenience, Applicant encloses a copy of pages 43 and 44 of the specification in which the above corrections are indicated in red.



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The Examiner is urged to telephone the undersigned Attorney for Applicant in the event that such communication is deemed to expedite prosecution of this matter.

Respectfully submitted,

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In order to understand the significance of the PMD file (i.e., metadata), note that the MCD software does not have knowledge of board types built into it. Instead, the MCD parameterizes its operations on a particular board by looking up the card type and version number in the PMD file and acting accordingly. Consequently, the MCD software does not need to be modified, rebuilt, tested and distributed with new hardware. The changes required in the software system infrastructure to support new hardware are simpler modify logical model 280 (Fig. 3) to include: a new entry in the PMD file (or a new PMD file) and, where necessary, new device drivers and applications. Because the MCD software, which resides in the kernel, will not need to be modified, the new applications and device drivers and the new DDL files (reflecting the new PMD file) for the configuration database and NMS database are downloaded and upgraded (as described below) without re-booting the computer system.

Network Management System (NMS):

Referring to Fig. 9, as described above, a user / network administrator of computer system 10 works with network management system (NMS) software 60 to configure computer system 10. In the embodiment described below, NMS 60 runs on a personal computer or workstation 62 and communicates with central processor 12 over Ethernet network 32⁴¹ (out-of-band). Instead, the NMS may communicate with central processor 12 over data path 34 (Fig. 1, in-band). Alternatively (or in addition as a back-up communication port), a user may communicate with computer system 10 through a console interface / terminal (840, Fig. 2a) connected to a serial line 66 connecting to the data or control path using a command line interface (CLI) protocol. Instead, NMS 60 could run directly on computer system 10 provided computer system 10 has an input mechanism for the user.

During installation, an NMS database 61 is established on, for example, work-station 62 using a DDL executable file corresponding to the NMS database. The DDL file may be downloaded from persistent storage 21 in computer system 10 or supplied separately with other NMS programs as part of an NMS installation kit. The NMS database mirrors the configuration database through an active query feature (described below). In one

embodiment, the NMS database is an Oracle database from Oracle Corporation in Boston, Massachusetts.

The NMS and central processor 12 pass control and data over Ethernet ⁴¹~~32~~ using, for example, the Java Database Connectivity (JDBC) protocol. Use of the JDBC protocol allows the NMS to communicate with the configuration database in the same manner that it communicates with its own internal storage mechanisms, including the NMS database. Changes made to the configuration database are passed to the NMS database to ensure that both databases store the same data. This synchronization process is much more efficient, less error-prone and timely than older methods that require the NMS to periodically poll the network device to determine whether configuration changes have been made. In these systems, NMS polling is unnecessary and wasteful if the configuration has not been changed. Additionally, if a configuration change is made through some other means, for example, a command line interface, and not through the NMS, the NMS will not be updated until the next poll, and if the network device crashes prior to the NMS poll, then the configuration change will be lost. In computer system 10, however, command line interface changes made to configuration database 42 are passed immediately to the NMS database through the active query feature ensuring that the NMS, through both the configuration database and NMS database, is immediately aware of any configuration changes.

Typically, work-station 62 is coupled to many network computer systems, and NMS 60 is used to configure and manage each of these systems. In addition to configuring each system, the NMS also interprets data gathered by each system relevant to each system's network accounting data, statistics, and fault logging and presents this to the user. Instead of having the NMS interpret each system's data in the same fashion, flexibility is added by having each system send the NMS (e.g., data collector server 857, Fig. 2a) a JAVA class file 410 indicating how its network data should be interpreted. Through the File Transfer Protocol (ftp), an accounting subsystem process 412 running on central processor 12 pushes a data summary file 414 and a binary data file 416 to the NMS. The data summary file indicates the name of the JAVA Class file the NMS should use to